The most important consideration is the squareness of the hammer head to the nail at the moment of impact. Sometimes in order to get a nail started, it is convenient to grip the handle closer to the head. However, this is a not a normal procedure because it substitutes the arm for the hammer handle.

Other examples of hammer misuse are:

Striking with the cheek of the hammer instead of the face. Using the claws of the hammer for work that is best done with a wrecking bar.

f) Driving nails

When driving nails, it should not be the intention to carry out the jobs with the least number of blows. This will lead to missing the nail and/or causing damage to the hand. In addition, nails that are driven in calmly will hold better because of the minimum distortion to the wood fibres that they cause. Bent fibres spring back more easily to grip the nail than those fibres that are split apart.

Blunt nails are much less likely to cause the wood to split than sharp ones, and sometimes a worker will deliberately blunt the point of the nail before using. However, there are situations where even this precaution will not prevent splitting. It is better to drill pilot holes for the nails before they are driven home. The size of the pilot hole should not be more than seventy five per cent of the nail shank diameter. The depth of the hole can be the same as the length of the nail, but by minimising this depth, the nail will be allowed to grip some solid wood.

When starting a nail and to determine the aim with the hammer, the face of the hammer should be rested on the nail head. The hammer is then drawn back slightly so that a light blow can be delivered. The nail head should be hit squarely, because this is the key to the avoidance of marring the project, bending the nail, or striking the thumb. The safest procedure is to tap the nail lightly in order to get it started and then the fingers can be moved out of harms way.

There are ways to start nails without placing fingers close to the impact area. These methods can be adopted as standard procedures, or they can be employed when the situation and the size of the nail demands them.. For instance, small brads can be held in place for starting, by pressing them through a slim piece of cardboard. The cardboard can then be removed when the brad has started.

When two pieces of wood have to be nailed surface to surface, a nail that is about 50 millimetres less than the combined thickness of the two parts should be used.

A standard rule for nailing edge pieces is to choose a length of nail that is three times the thickness of the wood that is being secured. However, this may not always be possible because of the thickness of the mating piece, in this case two thirds of the nail should penetrate the second piece.

Whenever possible a staggered pattern for nail placement should be used. This avoids driving the nails into a common centre line, which may cause the wood to split. Splitting may also occur when nails are driven near the end of wooden pieces. To avoid this small pilot holes should first be drilled. These holes should be smaller than the shank diameter of the nails being used.

Nails that are driven in at a slight angle provide a better grip than nails that are driven vertically into the wood. However, when driving nails in this position it is necessary to take extra care when the nail head nears the surface of the wood, because the hammer face will be at an angle and can easily dent the surface of the material.

g) Concealing nails

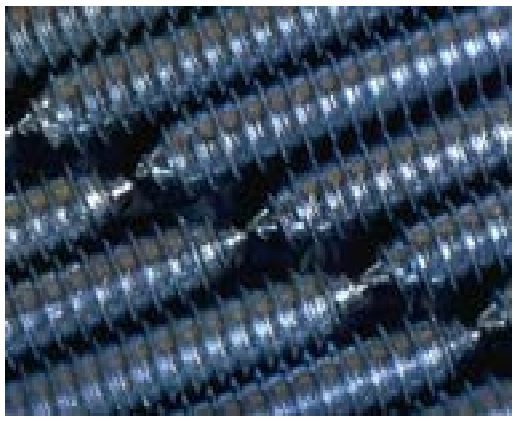
The standard method which is used when finishing nails and brads, is to drive the fastener until only the head is exposed. The final driving, to take the head below the surface of the wood can then be carried out by using a nail set, The hole that remains can them be filled with putty or plastic wood.

h) Removing nails

If a curved claw hammer is used in a correct manner to remove a nail, the nail will emerge in a straight condition. If the nail head projects slightly, the claws should be set so that the nail head is as close to the end of the slot as possible. The handle is then pulled back until the nail is partly drawn. A small block of wood is then placed under the hammer head, to improve the leverage, and to relieve unnecessary strain on the hammer handle.

2. Screws & Screw Drivers

a) Introduction



The many types of screw heads that have become available on the market has caused a bewildering array of screwdrivers of different types to appear, such as clutch head, Alien head, square drives, etc.. However, this course will only deal with regular wing type drivers that are designed for slotted screws and those with tips that are formed to fit screws with cross slots. These are the two styles of screws that are most commonly used in a workshop.

b) Screwdrivers

The driving force that turns the screw is the twisting action, or torque. This torque is supplied through the handle and down to the tip of the tool, which is placed in the head slot of the screw. The larger the screwdriver, then the more power can be applied, and it can be assumed that the size of the screwdriver has a direct relationship to the size of the screw for which it is designed to drive.

The length of the blade determines the sizes of screwdrivers. The longer the blade, then the broader and thicker will be the tip. This enables larger screws to be driven more efficiently. Screwdrivers can be purchased individually, but it is more economical to acquire a set. A typical assortment of six screwdrivers will have blade lengths ranging from 7.5 centimetres to 20 centimetres, and should include several sizes that are designed for cross cut screws.

The drive tip on most common screwdrivers has a wing-type shape and is designed to turn flathead, Roundhead and ovalhead screws that have slotted heads. The end of the blade finishes in a flare and grinding on both edges tapers it.

The width and thickness of the tip varies in relationship to the length of the blade. Therefore the selection of a screwdriver is based in relation to the size of the screw.

This type of screwdriver is probably the most abused tool in use. It is common practice to use it as a lever, a punch, a chisel, and even a can opener. Such uses can damage it and spoil it for its intended purpose.

A similar drive tip, which is usually called “the cabinet tip”, is tapered and ground square at its end. It does not flare out, and the width of the tip is equal to the diameter of the blade. Therefore, for example, it can be used to turn a screw which is at the bottom of a deep counter-bored hole, and also in other tight places.

Cross-slotted screws, or Philips screws, are widely used in industry, and they have also become popular for home projects. For these screws, a screwdriver is required that is shaped to fit the cross in the screw head.

c) Wood screws

Flathead screws are driven flush with the surface of the wood, in a countersunk hole, below the surface a counter bored hole. Roundhead screws are often used with flat washers.

These are practical fasteners when the part that is being attached consists of thin wood, plastic or sheet metal.

Ovalhead screws, which may be used with flush or countersunk washers, are often used for decorative purposes, or for components where easy disassembly is required.

When boards of equal thickness have to be joined, a screw length should be selected that is approximately 30 millimetres less than the combined thickness of the parts. The general rule that should be adhered to is that for components that differ in size, approximately two-thirds of the screw length should penetrate the thicker component.

d) Screw holes

When a screw is quite small and it is being driven into soft wood, a starting hole for the screw can often be made by using an awl.. However, most times, if the screw is to hold as it is designed to, and be drive able with minimum effort, the correct procedure is to drill a “body hole” and “lead hole”, and when necessary to countersink or Counter bore.

Counter boring is carried out with a twist drill, an auger bit, or a special Counter boring tool. The sizes of the holes are not arbitrally fixed. If the lead hole, which is sometimes called “the pilot hole”, is to small, then the screw will be hard to drive. This is especially so in the case of hardwoods. If the lead hole is too large, the threaded portion of the screw will not bite. When the correct sized holes have been prepared, the screws can be started by hand turning them until they catch. Once the screw is placed correctly, the free hand can be transferred to the blade, somewhere in the location of the screw.. This enables the fingers to act as guides to keep the driver correctly seated.

One way to correctly start the driver is to hold it at a very slight angle when the tip is placed in the screw head. The driver can then be brought to a vertical position before turning starts. It is very important throughout the whole procedure to keep the driver and the screw in a vertical position.

A fairly common method of starting a screw is to place it on the tip of the driver and then hold the screw and the tip together with the fingers of one hand, while holding the driver handle in the other hand. The screw point is placed into the starting hole while retaining the same grip. This allows the hand that is holding the screw to rest on the work. It is claimed by many, that this starting method is the easier way to ensure that the screw will start in a vertical position, however, whatever the starting system minimum power should be applied until the screw is firmly engaged. At this stage, the torque should be increase, but only to a sufficient level to complete the job.

3. Other Hardware

a) Heavy-duty fasteners

Nuts and bolts only play a small part in furniture and small project assemblies, but sometimes they are appropriate, and even necessary for heavy, utility type constructions. This is because they can give more holding power than ordinary wood screws.. They are often a good choice in the construction of outdoor furniture, and they are especially suitable for articles which may have to be taken apart for storage. Some of the heavy-duty fasteners are described here.

Lag screws

These are sometimes called “lag bolts”. They are very much like oversize wood screws but they have square or hexagonal heads, therefore they must be driven with a wrench. There installation follows the same procedure that is required for conventional tools. It is usual for them to be used with a flat washer in order to prevent the head damaging the wood, and also to provide more of a bearing surface against the component that is being secured. Diameter sizes that are applicable in a woodworking shop range from 60 to 120 millimetres. The lengths are in the range 2.5 to 30 centimetres.